African Invertebrates Vol. 44 (1) Pages 199–202 Pietermaritzburg August, 2003

New species of millipedes occurring in the Czech Republic: species discovered in the period 1970–2002

by

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ABSTRACT

Twelve previously unrecorded species were discovered in the Czech Republic between 1970 and 2002. These species, belonging to the Mediterranean and Atlantic zoogeographic zone, have so far been found in synanthropic and semi-natural habitats in the Czech Republic. The occurrence of thermophilic species may correlate with the gradual warming of Central Europe.

INTRODUCTION

The climate in the Czech Republic, located in Central Europe and therefore in the Central geographic zone (Kime 1985) is slowly getting warmer. Winters are becoming milder and average annual temperatures have been steadily increasing over the past ten years (Kalvová *et al.* 2001). The increase in the annual average of maximum, minimum and average daily temperatures was most significantly influenced by the increase in summer temperatures and, to a slightly lesser extent, also by the increase in average temperatures in winter and spring. The most significant for evaluation of climatic changes are sum deviations of circadial maximal and minimal temperatures above and below 15 °C. If the average temperatures for the past decade are compared with the average values for the period 1961–1990, it can be seen that winter maximal temperatures increased by 0.8–1.2 °C, the spring values by 0.5–1.2 °C and summer temperatures by 1.3–1.5 °C (Kalvová *et al.* 2001). Thermophilic millipedes are changing their ranges from the Mediterranean geographic zone towards the North, and the millipedes occurring in the Atlantic zone are shifting their areas more to the East (Kocourek 2001). The increase in average daily temperatures, accompanied by a decrease of very cold days in winter is suitable for the more thermophilic millipedes (e.g. *Melogona*, *Allajulus* and *Cylindroiulus)*, which are currently spreading into this area from the Mediterranean and Atlantic geographic zones (Kocourek 2001). The spreading of millipedes is often a consequence of human activities, such as the transportation of plants with soil (Kime 1985). In addition, some representatives of other geographic zones are beginning to inhabit appropriate niches in this area (Kocourek 2001). The Czech Republic occurs at the crossroad of various climatic zones, the west-east borderline and the north-south borderline. Each of the borderlines demarcates a territory with different climatic and natural conditions, and is therefore inhabited by different kinds of invertebrate animals. Millipedes that have recently been found in the Czech Republic were discovered mainly in synanthropic and semi-natural areas in warmer areas (thermophyticum).

MATERIALS

The species of millipedes new to the Czech Republic were identified, based on my own material collected n the years 1967–1970. The material collected in the years 1997–2002 was based both on the author's own collections and material supplied by other collectors. All samples are housed in the author's private collection and in the Department of Biology and Environmental Education at the Charles University of Prague, Faculty of Education.

RESULTS

Annotated list of species new to the Czech Republic

Order Chordeumatida Koch, 1847

Family Verhoeffidae

Haplogona oculodistincta **(Verhoeff, 1893)**. This is a Mediterranean mountain species with a relatively narrow area of distribution. It is a rare species occurring in northern Italy, Austria, Croatia and Slovenia. It is considered to be a stenotopic species. It is the first representative of the family Verhoeffidae recorded in the Czech Republic and was first collected in 1999 from Northern Moravia, Beskydy Mts, Horní Lomná village, 730 m. I assume that it reached this territory due to human influences.

Family Chordeumatidae

Melogona broelemanni **(Verhoeff, 1861).** This species reached the Czech Republic from the Mediterranean zone and is at its northern frontier here. It lives in flood plain areas as well as synanthropic habitats. From the viewpoint of habitat selection it is eurytopic. It was first found in 1970 from Central Bohemia, Distr. Kolín, Veletov and more recently (2001) in Central Bohemia, Distr. Benešov, Zlenice and in 2002 in Prague 6. This species colonises new territories by means of river streams and is also transported in gardening soil.

Melogona gallica **(Latzel, 1884).** The centre of distribution for this species is western and north-western Europe, in the Atlantic geographic zone. The isolated finding in 2000 in Northern Moravia, the Jizerské Mts, Lipový vrch near Dětřichov is the easternmost occurrence. I assume that it reached our territory due to human influences.

Order Julida Leach, 1840

Family Julidae

Cylindroiulus vulnerarius **(Berlese, 1888).** This blind julid was first discovered in the Charles University Botanical Gardens in Prague 2 in 2000. It is not a very mobile species and lives in garden soil. It rarely occurs in western and southern Europe. East of the Czech Republic it also occurs in Slovakia, but only in greenhouses. Its supposed origin is the Mediterranean zone. I assume that it reached our territory due to human influences.

Cylindroiulus truncorum **(Silvestri, 1896).** This species was found in the Charles University Botanical Gardens in 2000 and was later discovered in the Prague Zoological Garden in 2001. It lives under the bark of dead trees and in compost, where the larvae develop. It may even be active during warmer winters, when it breeds. My assumption is that it colonises new territories in transported gardening soil, judging by the fact that specimens have so far only been found in the two isolated localities.

***Cylindroiulus parisiorum* (Broelemann & Verhoeff, 1896).** This is a European, synanthropic species, which also occurs in tree hollows and rotted wood. Its widespread distribution in Europe indicates no special demands in terms of habitat. The direction of spread in Europe is not obvious. The origin is considered to be the Atlantic geographic zone. This species was found in 1988 in Prague 7, Cisařský island. It might have been inhabiting our territory for some time before being discovered, because it is very inconspicuous. When colonising new habitats, this species moves along river banks.

***Allajulus nitidus* (Verhoeff, 1891).** This pale and comparatively large cylindroiulid (about 2 cm) was found in Charles University Botanical Gardens in 2000, and recently also on the northern fringe of Prague (Sedlecké skály - Prague 9), in 2002. Its habitat is dependent on the occurrence of limestone. Prague is the most eastern locality where it can be found. It is an Atlantic species, which occurs more frequently in western Europe. Taking into consideration the fact that this species is very particular in terms of climate and the basidity of soil, it is assumed that it colonises new territories with human assistance.

***Brachyiulus lusitanus* Verhoeff, 1898.** This species was collected in Southern Moravia in the Nové Mlýny and Nejdek villages in 2001, and in Prague 6, 2001; both are synanthropic localities. It is a thermophilic species coming originally from the Mediterranean geographic zone. The collection in a garden centre in Prague 6 is, so far, the most northern location of this species. This species colonises new territories in water streams and in transported soil.

***Rossiulus vilnensis* Jawlowski, 1925**. This robust julid was first discovered in 1990 in Zubří (Eastern Bohemia). It is currently found in four isolated localities: the outskirts of Prague (Klánovický forest), Borkovická moorland nearby Veselí n. L. in Southern Bohemia, Zubří, and the Hradec Králové - Plachta locality in Eastern Bohemia. The species lives in marshy, low lying areas, mainly at the edges of peatbog, heath, forest, wet meadow - especially in ecotones between these habitats. *Rossiulus* originally comes from the Baltic geographic zone. Our findings indicate that this species colonises new territories on its own, without human assistance.

Order Polydesmida Leach, 1815

Family Polydesmidae

***Polydesmus germanicus* Verhoeff, 1896.** This polydesmid was found in the Prague Zoological Gardens in 2002. In Europe, this species is found in Switzerland and Germany, in the Central geographic zone. It is the smallest *Polydesmus* in the Czech Republic. I assume that it reached our territory due to human influences.

***Polydesmus angustus* Latzel, 1884.** This vagile polydesmid, quite frequently found in Europe, is progressing in an easterly direction. It is also colonising places containing waste wood. In semi-cultivated countryside it is generally sub-dominant to *Polydesmus complanatus* (Linnaeus, 1761). Lednice in southern Moravia is the most eastern location of this species so far discovered. In the Czech Republic it was found in 1971, in Central Bohemia, Distr. Kolín, Kolín-Borky forest. It generally colonises new territories on its own, but may also be transported in gardening soil.

Family Oniscodesmidae

***Amphitomeus attemsi* Schubart, 1934**. The species was first found in considerable numbers in the Charles University Botanical Gardens, Prague 2, in 2001. Due to its tropical origin (Southern America, Venezuela) it lives only in greenhouses in our latitudes, which is why its presence in the Czech Republic can be only ascribed to human influences. The species occurs in soil under the bark of wood lying on the ground. It was also found in the greenhouse of the Botanical Garden in Prague 7 - Troja.

CONCLUSIONS

- A total of 73 species of Diplopoda are currently recorded from the Czech Republic (Kocourek 2001).
- Newly found species account for more than 16 % of the overall number of Diplopoda found in the Czech Republic.
- Eleven species are considered to have been introduced with human assistance.
- One species, *R. vilnensis*, is considered to have spread naturally.
- Six species are spreading both on their own and with human assistance: *M. broelemanni, C. truncorum, C. parisiorum, A. nitidus, B. lusitanus, P. angustus.*
- The existing localities of the newly found Czech species indicate potential directions from which the millipedes from different geographical zones may spread into Czech territory.
- The climate in the Czech Republic is gradually becoming warmer. Thermophillic millipedes consequently have better conditions for colonising the territory. The newly found millipedes in the Czech Republic have so far been discovered mainly in synanthropic and semi-natural habitats.
- Phyto-geographic areas in the Czech Republic also reflect varying climatic conditions.
- The slow change of climatic conditions may have considerable impact on the diplopod fauna of the Czech Republic.

ACKNOWLEDGEMENTS

The author would like to thank Milan Řezáč (Prague), František Šťáhlavský (Prague), Štěpánka Táborská (Prague) and Pavel Vonička (Liberec) for millipede material.

REFERENCES

KIME, R. D. 1990. *Fauna Europaea Invertebrata. A provisional atlas of European myriapods.* Part I. European Invertebrate Survey, Cartographie des Invertébrés Européens, Erfassung der Europäischen Wirbellosen. Luxembourg.

KOCOUREK, P. 2001. Several new species of millipedes (Diplopoda) from the Czech Republic. *Acta Societatis Zoologicae Bohemicae* **65**: 81–96.

KALVOVÁ, J., KVĚTOŇ, V. & METELKA, L. 2001: Research into the significance of climatic changes triggered by the amplified impact of the Greenhouse Effect in the Czech Republic. Czech National Climatic Programme for the Air Protection. Department of the Czech Ministry of Environment, Prague.